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AUTHOR Bentley, Michael L.
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ABSTRACT

This paper describes J. Rosengren's post-final assignment and M. Harmin's truth signs activity that were incorporated into a secondary science methods course for preservice teachers. The strength of the post-final assignment is that it is a strategy for extending student learning past the end of a course and even beyond the initial teaching license. The truth signs activity helps future teachers reflect on their core educational values. Appended are sample post-final assignments for science teaching methods and curriculum courses. (Contains 11 references.) (WRM)

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# A POST-FINAL ASSIGNMENT FOR THE METHODS COURSE: PROVIDING AN INCENTIVE TO PROFESSIONAL GROWTH FOR FUTURE TEACHERS

**Michael L. Bentley, Virginia Tech**

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## Novel Strategies for the Methods Class

One important function for AETS as an organization of teacher educators is to foster communication about effective teaching strategies for science teacher preparation courses. Two new strategies/methods I have recently adapted to my own classes at Virginia Tech are the "post-final assignment" (Rosengren, 1993-1994) and the "truth signs" activity (Harmin, 1994). The strength of the post-final assignment is that it is a strategy for extending student learning past the end of the course, and even beyond the initial teaching license. It is a course component that can foster further professional development among beginning teachers, and it supports the ideal of life-long learning. The Truth Signs activity has different potential outcomes. The main value to me of this activity is that it helps future teachers reflect on their core educational values, and exposes them to an activity adaptable to their own science classrooms at any level.

## The Post-Final Assignment

Biologist John H. Rosengren. (1993-1994) regularly presents his students with a "Post-Final Assignment." The assignment, which is really optional and voluntary, is intended to "show students that college courses are just the beginning of acquiring knowledge." Rosengren wants to enable students to broaden their knowledge through the "discovery of new books to read and places to see." (p. 181) He provides his students with

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an annotated book list and requires them to read three or more books. His post-final assignment also includes a "Places to Go" list. After students have read a book or visited a site on the list, Rosengren asks them to send him a post card with their comments and reaction. While not revealing the numbers in his pool of former students, Rosengren claims to receive about ten post cards per year. Those students who complete the assignment receive a "Citation Certificate" and a book.

I have adapted Rosengren's idea to my science methods course and curriculum courses. Appended are recent versions of post-final assignments for two of my courses, *Methods for Teaching Secondary Science* (Appendix A) and *Secondary School Curriculum* (Appendix B). The secondary methods course at Virginia Tech is in the licensure sequence for students who have majored in biology, chemistry, physics or one of the earth-space sciences, and who are preparing themselves to be middle school or high school science teachers. Students taking the secondary curriculum course are also in a licensure program, but the class includes many non-science majors who are specializing in other secondary subject areas.

The post-final assignment is presented to each student individually during an exit interview on the last day of class. Students are not given a time limit for completing the assignment; they have the rest of their lives to do it (but, as I tell them, only the rest of *my* life to receive their certificates). I believe that whatever work my former students put into

this assignment it will be a rewarding experience and lead to learning and professional growth.

An example of a reading for the future secondary teachers is Jay Lemke's *Talking Science* (1990). This book explains his research in secondary science classrooms using methods of linguistic analysis that cast light on the hidden curriculum and on teachers' epistemological assumptions. Books on both lists include Aldo Leopold's *A Sand County Almanac* (1968) and Daniel Quinn's *Ishmael* (1993). These texts may enable the future teachers to think more deeply about the historic and ethical dimensions of their work in the classroom. Both works also may further these teachers' environmental education.

Examples of post-final assignment field sites for the new teachers to visit include the American Museum of Natural History in New York City and Chicago's Field Museum. New elementary teachers in my Elementary Curriculum course are sent off to Indianapolis' Children's Museum and Chicago's Museum of Science and Industry.

In post-final assignments for all classes, the new teachers are urged to share their lesson plan ideas and experiences with their peers, for example, by participating in an education-oriented listserv or by contributing an article for a teachers' publication, such as *Science and Children*, *Science Scope*, *The Science Teacher*, or *Science Activities*. New teachers also are urged to collaborate with their teaching colleagues in action research related to an area of interest. They are encouraged to attend an annual state or national convention,

such as those sponsored by the National Science Teachers Association or the National Council for the Social Studies and their state affiliates, and to submit a proposal to contribute a presentation at such meetings.

While some activities recommended in the post-final assignment are individual and others collaborative in nature, all promote professional development and life-long learning. I only began using this strategy in 1997 and still look forward to getting my first post card.

The "Truth Signs" Activity

In Merrill Harmin's (1994) ASCD-sponsored handbook of teaching methods, the "Truth Signs" activity is classified in the category of "Strategies for Expanding Student Confidence." It is a strategy he adopted from Pilon (1991), who prefers to call the activity "philosophy signs." Harmin claims that teachers have reported that the strategy works well at all grade levels and describes the strategy succinctly as "Posted signs that remind students of important truths about learning and living." (p. 49) He clarifies by adding that truth signs are not rules and are not directions on what to do (e.g. "raise your hand to speak"), but are reminders of important and relevant guiding ideals. Harmin provides a script for a model lesson that use the following five truth signs that he has posted in his own college classroom:

- "Everyone needs time to think and learn.
- We each learn in our own ways, by our own time clocks.
- It's okay to make mistakes. That's the way we learn.
- It's intelligent to ask for help. No one need do it all alone.

- We can do more and learn more when we're willing to risk." (p. 54)

In his model lesson, Harmin has the teacher displaying a single message to the class on a card, reading it aloud and having the class responsively read it together, and then initiating a discussion by asking the class if it is a "true saying." Following the discussion, after a consensus is reached about the truth of the saying, the card is posted on the classroom wall for continuous referral throughout the course. Harmin sites research by Hart (1983), Caine and Caine (1991), and Marzano (1992) and argues that it is "often heartening, reassuring, and strengthening" for students to be reminded of these posted verities. Harmin recommends using no more than six or seven signs in the classroom at a time so as not to dilute the power of the signs.

Here are two sample truth or philosophy signs I offered my own students in my science teaching methods course:

- "Practice is never a simple application of general rules to concrete situations, and theory is never the simple abstraction-generalization from practical situations to general schemes. Practice and theory, like knowledge and experience, stand in a relation of mutual adaptation, of mutual questioning, and of mutual illumination." (Bettencourt, 1993, p. 47)

- "The art of thus giving shape to human powers and adapting them to social service is the supreme art; one calling into its service the best of artists; that no insight, sympathy, tact, executive power, is too great for such service." (Dewey, 1954, p. 638)

After working with these signs in a manner similar to Harmin's method, I invite my students – who are concurrently carrying out internship hours in local schools - to find and post truth

signs in their own classes. My students enjoy this activity and eagerly research their own truth signs. Here is a sampler of the Truth Signs suggested by my Fall 1998 secondary science methods students:

- Never let yesterday's disappointments overshadow tomorrow's dreams.
- A mind is like a parachute...it works best when OPEN.
- Know your limits, then break them.
- "Progress always involves risk. You can't steal second base and keep your foot on first."
- "The whole point of getting things done is knowing what to leave undone." Stella, Lady Reading
- "Justice cannot be for one side alone, but must be for both." Eleanor Roosevelt
- "Quarrels would not last long if the fault were only on one side." Francois de La Rochefoucauld
- "Teamwork is the fuel that allows common people to produce uncommon results." - Anon.
- "What happens to a man (sic) is less significant than what happens within him." - Anon.
- "If we are to achieve a richer culture, rich in contrasting values, we must recognize the whole gamut of human potentialities, and so weave a less arbitrary social fabric, one in which each diverse gift will find a fitting place." Margaret Mead

## Conclusion

In this paper I discussed two novel teaching strategies suitable for use in teacher preparation courses. Rosengren's "post-final assignment" is a strategy which enables students to see past the end of the course and into their lives as professional teachers. It is a course component that can lead to professional growth and it supports the ideal of life-long learning. Harmin's "Truth Signs" activity has the potential to help future teachers reflect on their core educational values. It is an activity that beginning teachers can immediately adapt to their own science classrooms at any level.

## References


Bettencourt, A. (1993). The construction of knowledge: A radical constructivist view. In K. Tobin (Ed.). *Constructivism: The practice of constructivism in science education.* Washington, D.C.: American Association for the Advancement of Science, 39-50.

Caine, R. & Caine, G. (1991). *Making connections: Teaching and the human brain.* Alexandria, VA: ASCD.

Dewey, J. (1954). My Pedagogic Creed. In R. Ulich, *Three Thousand Years of Educational Wisdom.* Cambridge: Harvard U Press. (Originally published in 1897)

Harmin, M. (1994). *Inspiring active learning: A handbook for teachers.* Alexandria, VA: Association for Supervision and Curriculum Development.

Hart, L. (1983). *Human brain, Human learning.* New York: Longman.

Lemke, J. L. (1990). *Talking science: Language, learning, and values.* Norwood, N.J.: Ablex Publishing Corporation.

Leopold, A. (1968, orig. 1949). *A sand county almanac*. New York.: Oxford University Press.

Marzano, R. J. (1992). *A different kind of classroom: Teaching with dimensions of learning*. Alexandria, VA: ASCD.

Pilon, G. H. (1983). *Self-concept and reading the workshop way*. New Orleans, LA: Workshop Way.

Quinn, D. (1993). *Ishmael*. New York: A Bantam/Turner Book.

Rosengren, J. H. (1993, Dec.-1994, Jan.). A post-final assignment: Continuing education beyond the classroom. *Journal of College Science Teaching, 23*(3), 181-182.

Appendix A

SAMPLE POST-FINAL ASSIGNMENT FOR A SCIENCE TEACHING METHODS COURSE

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EDCI 5784 GRAD. SEM. IN ED.: Tchg in Secdy Sch I: Science FALL, 1998

**A Post-Final Assignment: Continuing Education beyond the Classroom**

You have now completed the University's requirements for the course EDCI 5784. However, in the instructor's view, you have just commenced your study of science education. The purpose of a post-final assignment is to "show students that college courses are just the beginning of acquiring knowledge." (Rosengren, 1993-94, p. 181) If and when you complete the assignment you will receive a "Citation Certificate" and a book.

Your assignment, if you should choose to accept the challenge, is to complete any *three* readings in the first group (books), any *three* items in the second group (field trips, museums, etc.), and any *one* item in the third group (taking action). When you have

completed the assignment, send a post card to me, c/o the Department of Teaching and Learning, Mail Stop 0313, VT, Blacksburg, VA 24061.

On the post card, include a few sentences representing your response to the experience. Your response will be recorded and my grade book will show you received the Citation Certificate. Note that there is no time limit for completing this assignment - you have the rest of your life to do it (but only the rest of *my* life to receive your certificate)! Your work on this assignment will be rewarding as you continue to grow professionally and learn.

**Category One: Books**

Read any*three* of the following:

Bentley, M. L. (1998). Constructivism as a referent for science education. In M. Larochelle, N. Bednarz, & J. Garrison, (Eds.), Constructivism and Education. New York: Cambridge University Press, pp. 233-249. The text is available from the Bentley webpage http://www.chre.vt.edu/bentley Also see: http://www.cup.cam.ac.uk/scripts/webbook.asp3.Isbn=0521621356 . This is a chapter in a book on constructivism in education and is listed in the syllabus. The article represents this instructor's position regarding the current education reform movement.

Cole, M. and Griffin, P. (Eds.). (1987). Contextual factors in education: Improving science and mathematics education for minorities and women. Madison, WI: Wisconsin Center for Educational Research, University of Wisconsin.

Freire, P. and Macedo, D. (1987). Literacy: Reading the word and the world. South Hadley, MA: Bergin & Garvey Publishers, Inc.

Driver, R., Squires, A., Rushworth, P., & Wood-Robinson, V. (1994). Making sense of secondary science: Research into children's ideas. New York: Routledge.

Lemke, J. L. (1990). Talking science: Language, learning, and values. Norwood, NJ: Ablex Publishing Corporation.

Orr, D. (1992). Education and the transition to a postmodern world. Ithica, NY: State University of New York Press.

Leopold, A. (1968, orig. 1949). A sand county almanac. New York: Oxford University Press.

Quinn, D. (1993). Ishmael. New York: A Bantam/Turner Book.

Sagan, C. (1997). The demon-haunted world: Science as a candle in the dark. New York: Random House.

**Category Two: In the Field**

- Visit a world-class museum and study it as a curriculum resource. Take notes about the museum's contents and its potential contribution to your middle/ high school class. The Smithsonian Institute museums are all world-class (e.g. Air and Space Museum, Natural History Museum, National Zoological Park). Other examples include the Field Museum, Chicago (Lake Shore Dr., 60605), the Museum of Science & Industry, Chicago (57th & Lake Shore Dr., 60637), and the Museum of Natural History (79th Street and Central Park West, New York).

- Visit a regional science/natural history museum – for example, the Science Museum of Virginia, Richmond, the North Carolina State Museum of Natural Sciences, Raleigh, NC 27626 (http://museums.mdmi.com/naturalsciences/ ), and the Virginia Museum of Natural History, Martinsville, VA (http://minerva.acc.virginia.edu/~vnmh-uva/)/

- Attend a state convention of a professional science teachers' organization – a state affiliate of NSTA or a teachers' organization in your field. For example, in Virginia, the Virginia Association of Science Teachers meets annually in the fall. Another example is the American Association of Biology Teachers (AABT), which represents life science teachers.

- Attend a regional or national convention of a professional science teachers' organization. For example, the National Science Teachers Association hosts several regional meetings each fall, and a national meeting in the spring. The North American Association for Environmental Education meets in the fall. Info on meetings can be found on the organizations web page (see links from the Science Education Program homepage).

- Participate in a summer professional development institute program. Institutes are sponsored by federal agencies as NASA, NSF, and the Department of Energy, and organizations like the Association for Supervision and Curriculum Development

(ASCD), NSTA, museums, and state education departments. Recent summer instituteds include NEWMAST, NEWEST, NEW, the Keystone Science Institute, and Project Atmosphere. For programs in your area, check out the state department of education, the VAST home page (or your state science teachers' organization), or NSTA's home page. An alternative experience in this category would be to participate in an Earthwatch expedition. For information about Earthwatch expeditions, contact Earthwatch, 680 Mount Auburn St., PO Box 1904, Watertown, MA 02272.

**Category Three: Taking Action**

- Share your teaching ideas and experience with your peers. Write an article for a local, regional, state, national, or international science education journal or magazine - such as *Science and Children*, *Science Scope*, *The Science Teacher*, or *Science Activities*, or submit to a general teachers magazine, such as the *Middle School Teacher*. Alternatively, submit a proposal to do a presentation before your peers at a state, regional, national or international science (or biology, chemistry, earth science, physics...) teachers' convention.

- Collaborate with one or more teaching colleagues in action research related to some area of mutual interest in your teaching. For example, you might decide to change some aspect of your teaching, such as, for instance, implementing a portfolio assessment system, or using a new technology or method.

- Attend *at least* three (they need not be consecutive, but note the date and sequence) meetings of your local school board - either where you teach or where you live. Reflect on the meaning for the local secondary school curriculum of the deliberations and decisions you witness there.

- Volunteer for and participate as a member of the Science Committee or Curriculum Committee of the school or district in which you teach. Document the activities of the Committee and evaluate the school's or district's success in reaching its goals.

- Spend a summer as a paid or volunteer naturalist/interpreter at a state or national park. The National Park Service maintains a web page at http://www.nps.gov, which includes information on individual parks as well as job and volunteer information. You may also write to Seasonal Employment Program, Human Resources Office, National Park Service, PO Box 37127, Mail Stop 2225, Washington, DC 20013.

References

Rosengren, J. H. (1993, Dec.-1994, Jan.). A post-final assignment: Continuing education beyond the classroom. Journal of College Science Teaching, 23(3), 181-182.

Appendix B

SAMPLE POST-FINAL ASSIGNMENT FOR A CURRICULUM COURSE

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EDCI5694 Secondary School Curriculum SAVE FOR FUTURE REFERENCE

A Post-Final Assignment for Curriculum: Continuing Education beyond the Classroom

The purpose of a post-final assignment is to "show students that college courses are just the beginning of acquiring knowledge." (Rosengren, 1993-94, p. 181) If and when you complete the assignment you will receive a "Citation Certificate" and the first three to complete the assignment also will receive a book.

You have now completed the University's requirements for the course EDCI 5694, Secondary School Curriculum. However, in the instructor's view, you have just *commenced* your study of curriculum and instruction. Consequently, the assignment, if you should choose to accept the challenge, is to investigate curriculum in your field in greater depth by selecting activities from the choices below.

When you have completed the assignment, send a post card to me, Michael L. Bentley, c/o the Department of Teaching and Learning, Mail Stop 0313, Virginia Tech, Blacksburg, VA 24061. On the post card, include a few sentences representing your response to the activities and what you learned. Your card will be recorded in my grade book and you will receive a "Citation Certificate" and a book.

Note that there is *no time limit* for completing this assignment - you have the rest of your life to do it (but only the rest of *my* life to receive your Certificate!). I believe that your work on this assignment will be rewarding as you continue to grow professionally and experience the use of various resources in teaching your subject to secondary students.

**Post-Final Assignment for EDCI 5694**

**Category One**: *Read at least one of the following:*

Bowers, C. A., & Flinders, D. J. (1990). Responsive teaching: An ecological approach to classroom patterns of language, culture, and thought. New York: Teachers College Press.

Larochelle, M, Bednarz, N., & Garrison, J. (Eds.). Constructivism and Education. New York: Cambridge University Press.

McCutcheon, G. (1995). Developing the curriculum: Solo and group deliberation. New York: Longman Publishers USA.

Orr, D. (1992). Education and the transition to a postmodern world. Ithica, NY: State University of New York Press.

Posner, G. J. (1995). Analyzing the curriculum. 2nd. ed. New York: McGraw-Hill, Inc.

Ross, E. W., Cornett, J. W. & McCutcheon, G. (Eds). (1992). Teachers' personal theorizing: Connecting curriculum practice. Albany, NY: SUNY Press.

Sarason, S. (1996). Revisiting the culture of the school and the problem of change. New York: Teachers College Press.

Sizer, T. R. (1992, 1985, 1984) Horace's compromise: The dilemma of the American high school. Boston: Houghton Mifflin Company.

Slattery, P. (1995). Curriculum development in the postmodern era. New York: Garland Publishing, Inc.

**Category Two**: Sites to See, Places to Go. *Do one of the following:*

- Visit a first-class, world-class museum and study it from a teacher perspective, as a curriculum resource. Take notes about the museum's contents and the learning potential there for high school students in your subject.

(The Smithsonian Institute museums are all first-class. An example of a world class museum in the science area is the Museum of Natural History, 79th Street and Central Park West, New York.)

- Attend a state convention of the professional state teachers' organization in your field. For example, in Virginia, the Virginia Association of Science Teachers meets annually in the fall.

- Attend a meeting of the professional national teachers' organization in your field. For example, in science, the National Science Teachers Association hosts several regional meetings each fall, and a national meeting in the spring.

- Participate in a summer professional development institute program in your field. Various institutes are sponsored by the Association for Supervision and Curriculum Development (ASCD), subject-area organizations, museums, organizations like the John Dewey Society and the Bertran Russell Society, state education departments using Eisenhower grants, and federal agencies like NASA and the Department of Energy. For programs in your area, check with your state's department of education, your state teachers' organization in your subject area, or the national organization. An alternative experience in this category would be to participate in an Earthwatch expedition. For information about Earthwatch expeditions, contact Earthwatch, 680 Mount Auburn St., PO Box 1904, Watertown, MA 02272.

**Category Three**: Taking Action. *Do one of the following:*

- Share your teaching ideas and experience with your peers. Write an article for a local, regional, state, national, or international teachers' publication in your field, or a piece for a general teachers magazine, such as *Middle School Teacher*. Alternatively, submit a proposal to do a presentation before your peers at a state, regional, national or international teachers' convention.

- Collaborate with one or more teaching colleagues in action research related to some area of mutual interest in your teaching. For example, you might decide to change some aspect of your teaching, such as, for instance, implementing a portfolio assessment system, or using a new technology or method.

- Attend *at least* three (they need not be consecutive, but note the date and sequence) meetings of the local school board either where you teach or where you live. Reflect

on the meaning for the local secondary school curriculum of the deliberations and decisions you witness there.

- Complete Activity 7-2, which involves interviewing teachers about curriculum change, (Doll, 1996, p. 335). Reflect on your findings and what they mean for curriculum renewal in this school system.

- Volunteer for and participate as a member of the Curriculum Committee of the school in which you teach. Document the activities of the Committee and evaluate the school's success in reaching its curriculum goals and objectives.

References

Doll, R. C. (1996). Curriculum improvement: Decision-making and process. 9th ed. Boston: Allyn and Bacon.

Rosengren, J. H. (1993, Dec.-1994, Jan.). A post-final assignment: Continuing education beyond the classroom. Journal of College Science Teaching, 23(3), 181-182.